

Bioimaging in Radiotherapy for Lung Cancer

Investigators:

Noah C. Choi, M.D. (PI)

Alan Fischman, M.D.,Ph.D. Andrzej Niemierko, Ph.D

Marek Ancukiewicz,Ph.D. Thomas Lynch, M.D.

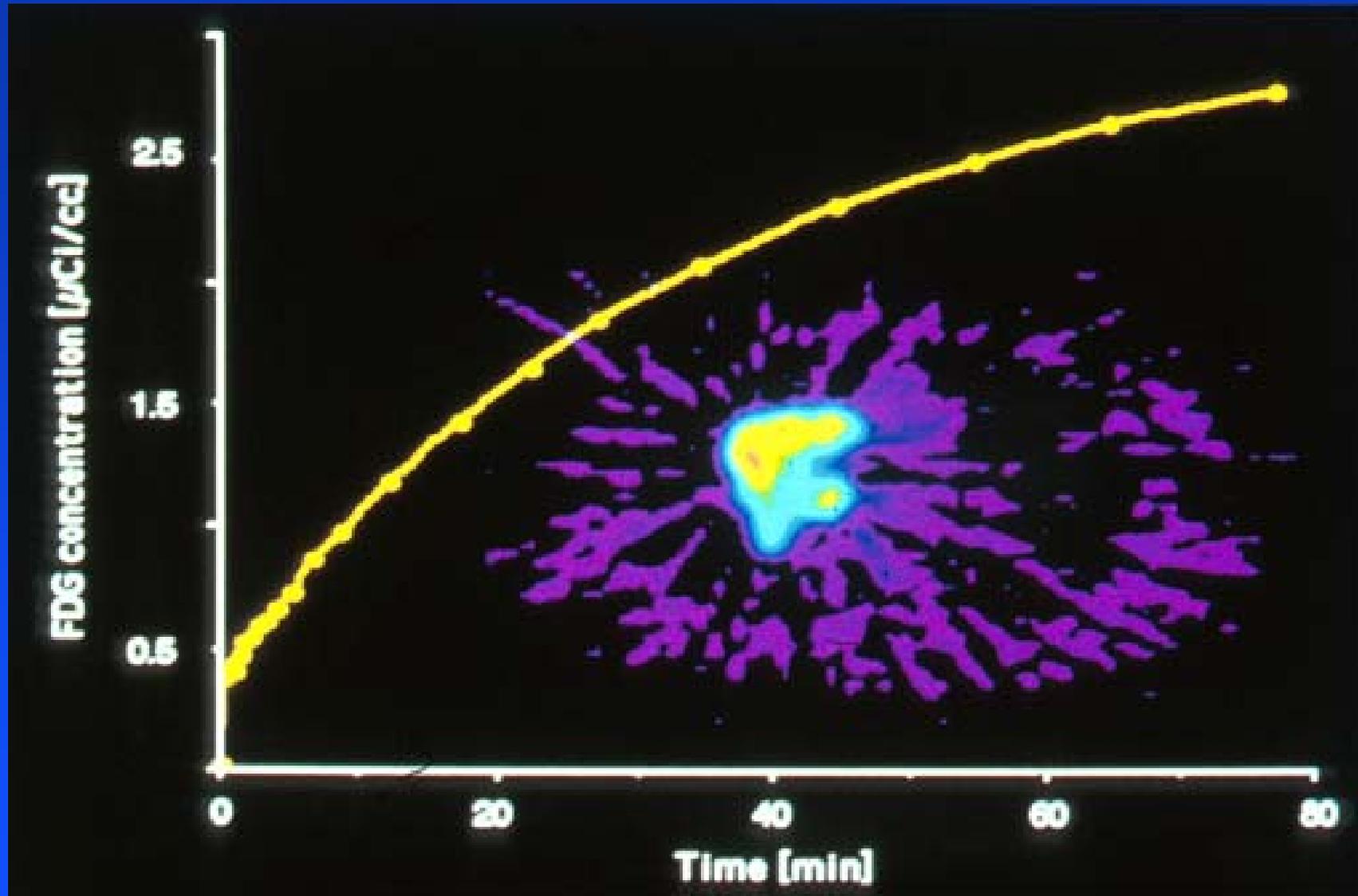
Douglas Mathisen,M.D. Richard Kradin, M.D.

Massachusetts General Hospital

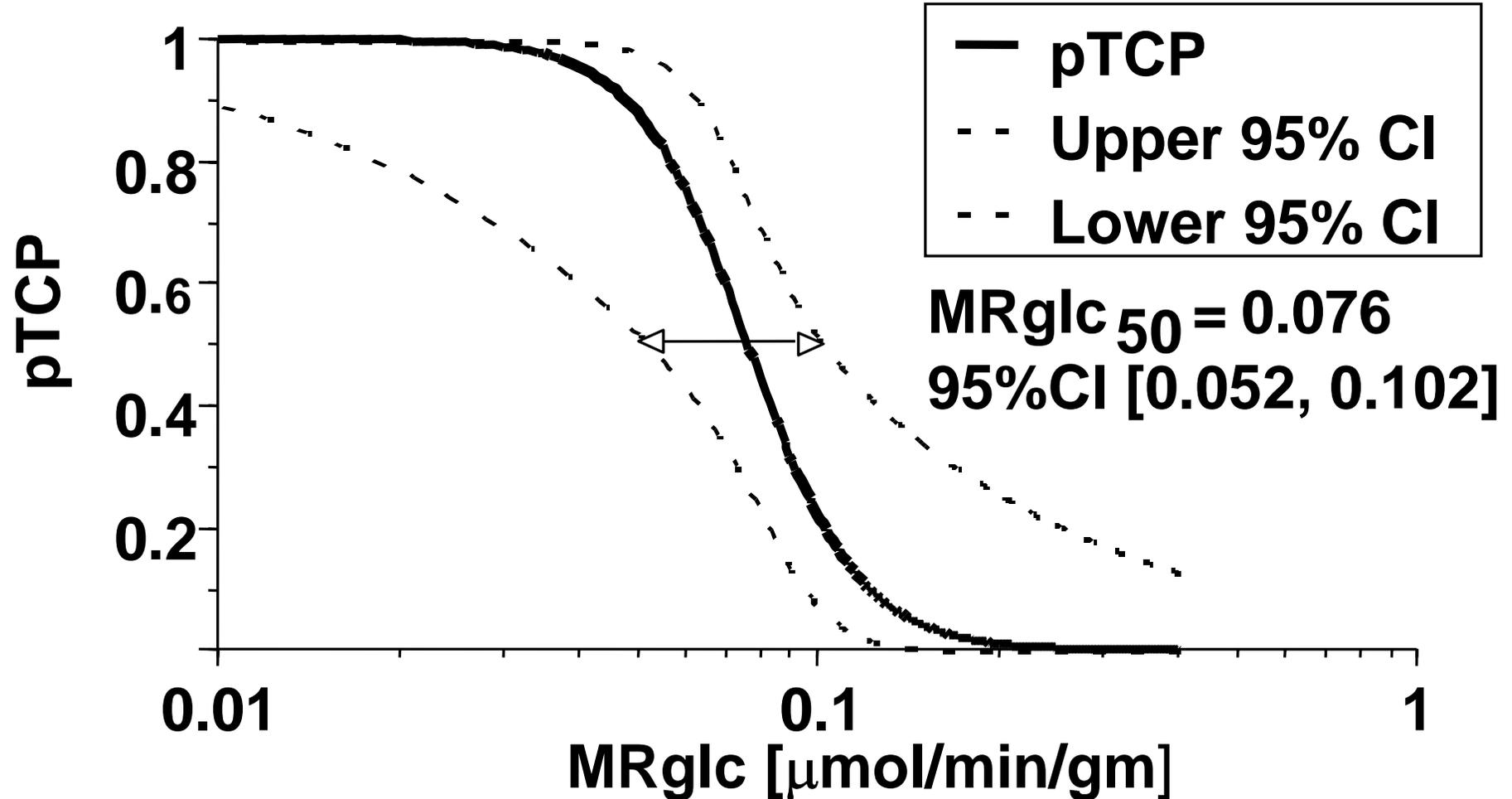
Harvard Medical School

Support: 1 RO1 EB02907-01

FDG Uptake Curve in Lung Cancer



Dose-Response Relationship Between pTCP And MRglc



Follow-up Study 1

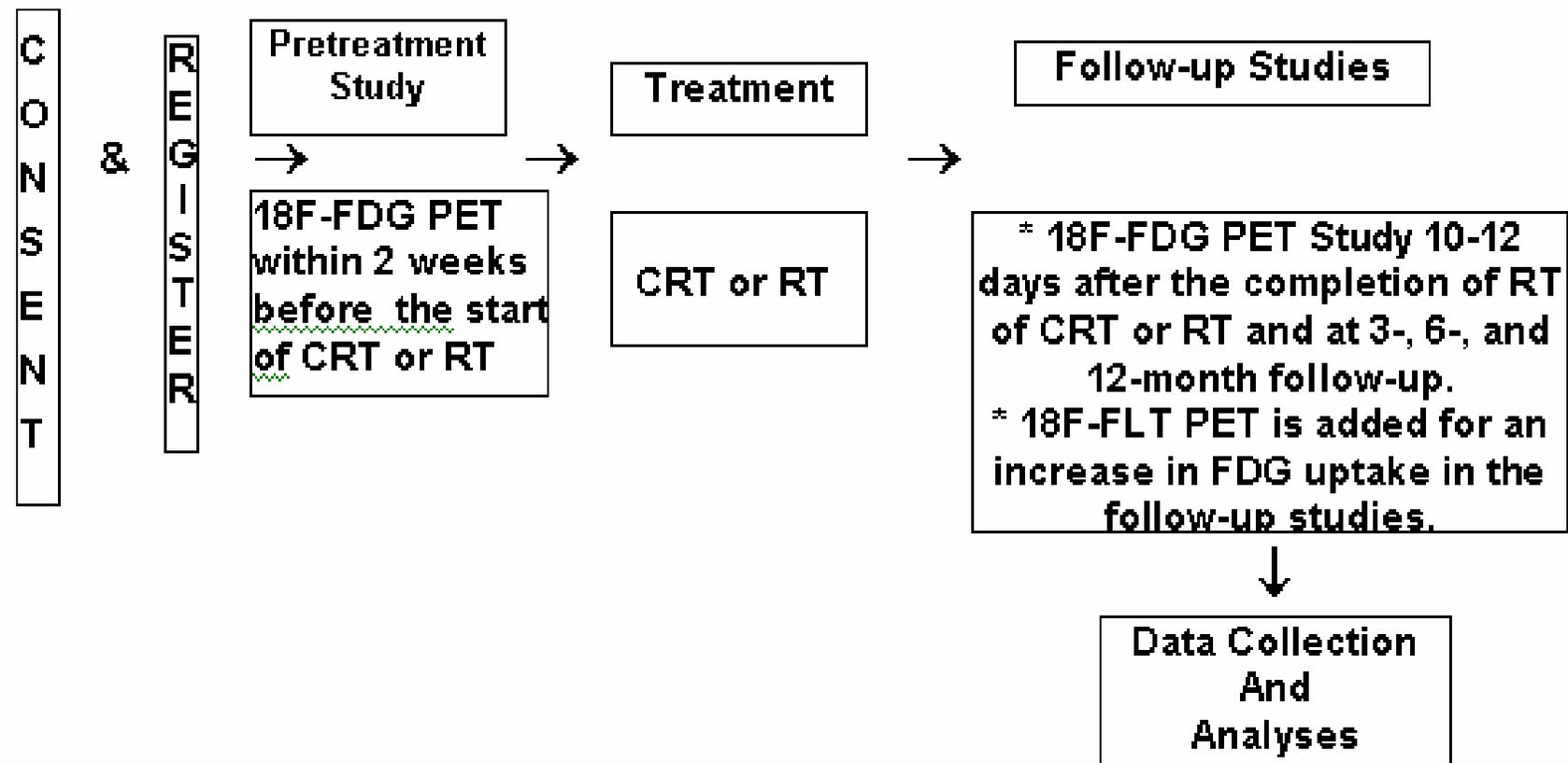
Primary Objective

*To determine MRG, obtained 10-12 days after RT or RT of CT+R, which corresponds to **cTCP** \geq 95% at 12 months*

Methods

*In vivo assay in a clinical setting
(Partners Protocol 03-282)*

STUDY SCHEMA (Protocol 03-282)



18F-FDG PET: 18F-fluoro-2-deoxy-D-glucose (18F-FDG) and positron emission tomography (PET),
CRT: Concurrent chemoradiotherapy, RT: Radiation therapy, 18F-FLT PET: 3'-deoxy-3'-[18-F]
fluorothymidine (18F-FLT) PET.

Timetable for Overall Project (Protocol 03-282)

<u>Study Period (Year)</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>Total</u>
Patients to be accrued per year	40	41	41	-	-	122
Patients eligible for 18F-FDG PET 10-12 days after RT of CRT or RT*	35	35	35	-	-	105
Number of patients eligible for 18F-FDG PET at 3 months**	18	28	28	10	-	84
Number of patients eligible for 18F-FDG PET at 6 months***	12	24	24	12	-	72
Number of patients eligible for 18F-FDG PET at 12 months****	0	16	16	16	-	48
Number of patients eligible for 18F-FLT PET##	10	16	16	6	-	48

Progress Report

1. Study Protocol: Partners 03-282

Date of Activation - 12/29/03

Patient Accrual - 16 patients in 4.5 months

Number of patients to be accrued - 40 (first year)

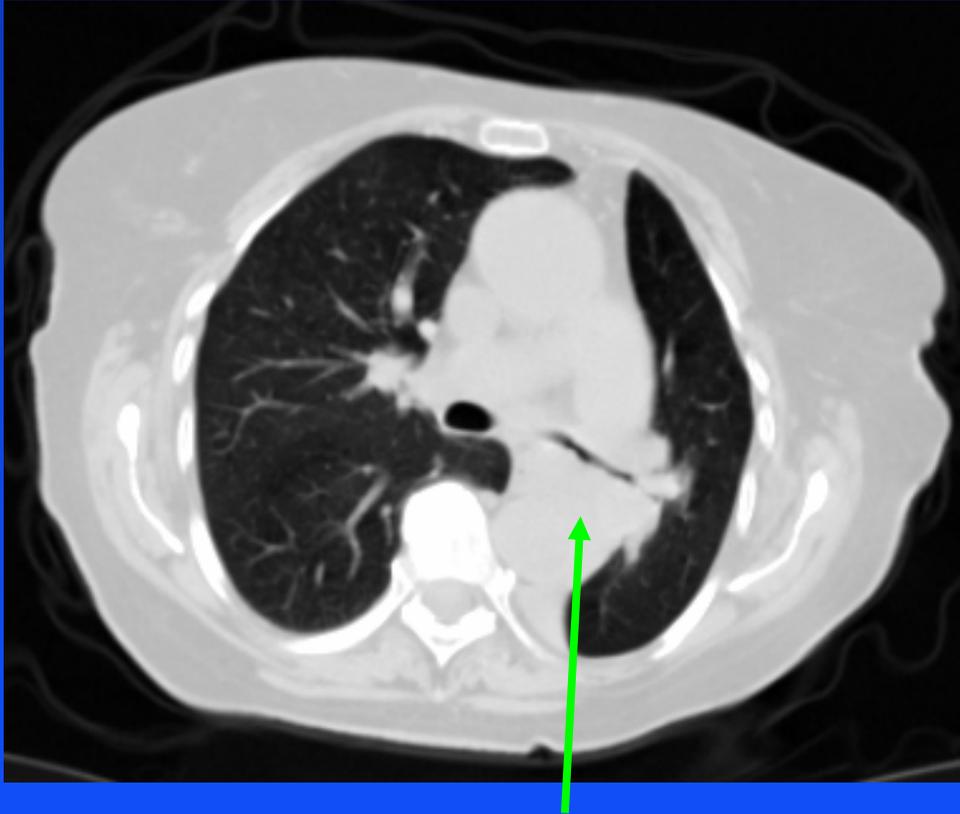
2. Number of FDG PET studies

7 patients - 2 studies

9 patients - 1 study

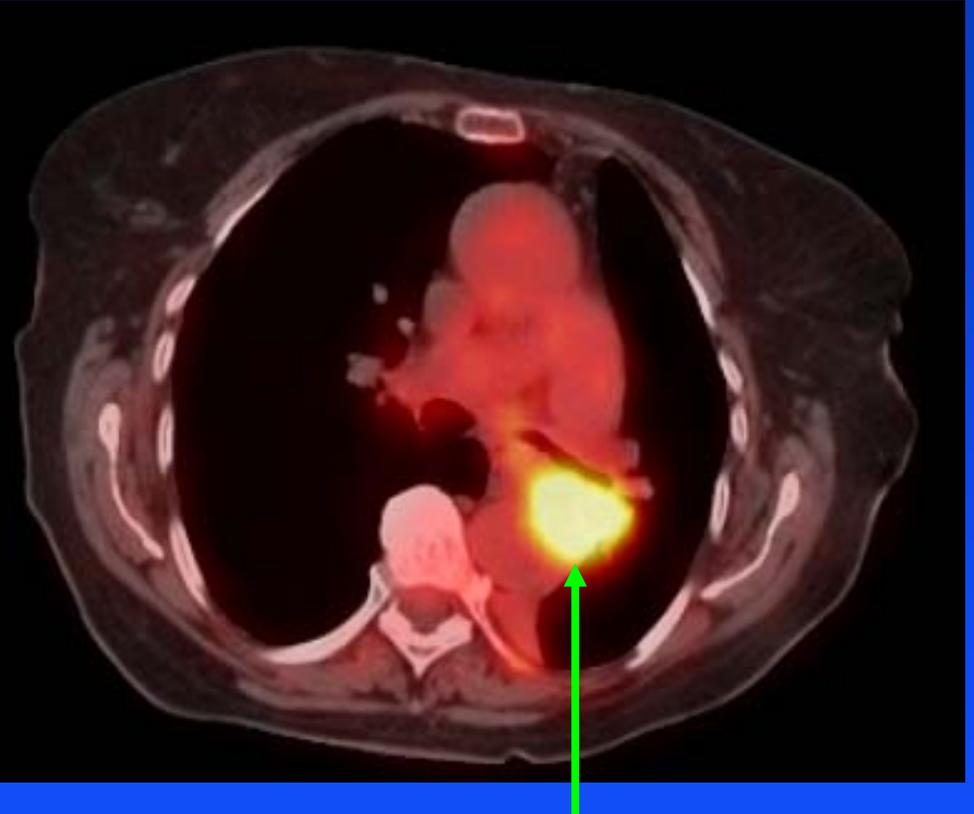
Bio-image Guided Target for Radiation

CT Image



Poorly Defined Tumor Margins

Fused CT-PET Image



FDG Avid Tumor